Claims

What is claimed is:

1. A dispersion compensating optical fiber, comprising:

a segmented core having at least three segments, the refractive index profile being selected to provide

total dispersion at 1595 nm between about -95 ps/nm-km and -225 ps/nm-km; and

a dispersion slope more negative than -1.0 ps/nm^2-km at 1595 nm.

2. The dispersion compensating optical fiber of claim 1 wherein the total dispersion at 1595 nm is between about -110 ps/nm-km and -150 ps/nm-km.

3. The dispersion compensating optical fiber of claim 1 wherein the total dispersion is between about -80 ps/nm-km and -190 ps/nm-km over a wavelength range from about 1570 nm to 1620 nm.

4. The dispersion compensating optical fiber of claim 1 wherein at least one of the segments has an α-profile where α is between about 2.0 and 2.2.

5. The dispersion compensating optical fiber claim 1 wherein Δ_1% is positive, Δ_2% is negative, and Δ_3% is positive.

6. The dispersion compensating optical fiber of claim 5 further comprising a central core segment having a positive Δ_1% greater than 1.5%, a moat segment adjoining the central core segment and having a negative Δ_2% more negative than –0.4%, and a ring segment adjoining the moat segment having a positive Δ_3% greater than 0.7%.

7. The dispersion compensating optical fiber of claim 5 wherein a volume of the central core segment is in the range of about 9 units and 11 units, and a volume of the ring segment is in the range of about 40 units to 47 units.

8. The dispersion compensating optical fiber of claim 1 further comprising:

a central core segment having a Δ_1% in the range of about 1.5% to 2.0% and a radius R_1 in the range of about 1.5 μm to 2.0 μm,

a moat segment having a Δ_2% in the range of about -0.3% to -0.9% and a radius R_2 in the range of about 4.5 μm to 6.5 μm, and

a ring segment having a Δ_3% in the range of about 0.6% to 1.1%, a mid point radius R_3 in the range of about 6.0 μm to 8.0 μm.

9. The dispersion compensating optical fiber of claim 1 further comprising:

a central core segment having a positive Δ_1% greater than 1.7%,

a moat segment adjoining the central core segment having a negative Δ_2% more negative than –0.5%, and

a ring segment adjoining the moat segment having a positive Δ_3% greater than 0.8%.

10. The dispersion compensating optical fiber of claim 1 further comprising a volume of the ring segment greater than about 40 units.

11. The dispersion compensating optical fiber of claim 1 further comprising a ring segment having Δ_3% of greater than 0.7%.

12. The dispersion compensating optical fiber of claim 11 further comprising a Δ_3% of the ring segment between 0.7% and 1.0% and a midpoint radius R3 between 6.5 μm and 8.0 μm.

13. The dispersion compensating optical fiber of claim 1 further comprising:

a central core segment having a $\Delta_1\%$ in the range of about 1.7% to 1.9% and a radius R_1 in the range of between about 1.7 μm to 1.9 μm,

a moat segment having a $\Delta_2\%$ in the range of about –0.5% to -0.7% and an radius R_2 of between 5.0 μm and 6.0 μm, and

a ring segment having a $\Delta_3\%$ in the range of about 0.75% to 0.9%, a midpoint radius R_3 in the range of about 6.5 μm to 8.0 μm, and a width in the range of about 0.7 μm to 1.2 μm.

14. The dispersion compensating optical fiber of claim 1 further including a kappa value defined as the dispersion at 1595 nm divided by the dispersion slope at 1595 nm of between 90 nm and 110 nm.

15. The dispersion compensating optical fiber of claim 1 further including a kappa value defined as the dispersion at 1595 nm divided by the dispersion slope at 1595 nm of between 90 nm and 105 nm.

16. The dispersion compensating optical fiber of claim 1 further including a kappa value defined as the dispersion at 1595 nm divided by the dispersion slope at 1595 nm of between 95 nm and 100 nm.

17. The dispersion compensating optical fiber of claim 1 further comprising a range of kappa values defined as the dispersion at a particular wavelength divided by the dispersion slope at the particular wavelength over the range of 1570 nm to 1620 nm of between 80 nm to 155 nm.

18. The dispersion compensating optical fiber of claim 17 further comprising a range of kappa values defined as the dispersion at a particular wavelength divided by the dispersion slope at the particular wavelength over the range of 1570 nm to 1620 nm of between 85 nm to 110 nm.

19. The dispersion compensating optical fiber of claim 1 further comprising a pin array of less than 7 dB at 1595 nm.

20. The dispersion compensating optical fiber of claim 1 further comprising a cutoff wavelength for a next higher order mode above LP_{01}, the cutoff wavelength being less than 2025 nm.

21. The dispersion compensating optical fiber of claim 1 further comprising an effective area at 1595 nm of greater than 15 μm^2.

22. The dispersion compensating optical fiber of claim 21 further comprising an effective area at 1595 nm of greater than 17 μm^2.

23. The dispersion compensating optical fiber of claim 1 further comprising an dispersion slope over the wavelength range of between about 1570 nm and 1620 nm of between –0.7 ps/nm^2-km and –2.5 ps/nm^2-km.

24. The dispersion compensating optical fiber of claim 23 further comprising an dispersion slope over the wavelength range of between about 1570 nm and 1620 nm of between -1.0 ps/nm^2-km and –1.8 ps/nm^2-km.

25. The dispersion compensating optical fiber of claim 1 further comprising an dispersion slope at 1595 nm of between -1.0 ps/nm^2-km and –2.5 ps/nm^2-km.

26. The dispersion compensating optical fiber of claim 1 further comprising an dispersion slope at 1595 nm of between -1.2 ps/nm^2-km and -1.5 ps/nm^2-km.

27. The dispersion compensating optical fiber of claim 1 further comprising an dispersion slope at 1595 nm more negative than -1.2 ps/nm^2-km.

28. The dispersion compensating optical fiber of claim 1 further comprising dispersion slope that is more negative than -0.7 ps/nm^2-km over the entire L-band from 1570 nm to 1620 nm.

29. The dispersion compensating optical fiber of claim 28 further comprising a dispersion slope that is more negative than -1.2 ps/nm^2-km over the entire L-band from 1570 nm to 1620 nm.

30. The dispersion compensating optical fiber of claim 1 further comprising:

a central core segment having an outer radius R_1 in the range of between about 1.5 μm and 2.0 μm,

a moat segment having an outer radius R_2 in the range of between about 4.5 μm and 6.5 μm, and

a ring segment having a midpoint radius R_3 in the range of between about 6.0 μm to 8.0 μm.

31. The dispersion compensating optical fiber of claim 30 further comprising a an outer radius R_4 of the ring segment in the range of between about 10 μm and 12 μm.

32. An optical transmission system having a dispersion compensating optical fiber, wherein the dispersion compensating fiber comprises:

a segmented core having at least three segments, the refractive index profile being selected to provide

total dispersion at 1595 nm between about -95 ps/nm-km and -225 ps/nm-km; and

a dispersion slope more negative than -1.0 ps/nm^2-km at 1595 nm.

33. The optical transmission system of claim 32 further comprising a non-zero dispersion shifted fiber coupled to the dispersion compensating fiber, the non-zero dispersion shifted fiber having a dispersion slope of between about 0.065 and 0.08 ps/nm^2-km at 1595 nm.

34. The optical transmission system of claim 33 wherein the non-zero dispersion shifted fiber has a dispersion of between about 6.5 and 8.5 ps/nm-km at 1595 nm.